



WORK SHEET

Module 4.1

Calculating Braking Distances

Name _____

Date _____

Score _____

Feet Per Second Calculation

One mile = 5,280 feet

One hour = 3,600 seconds

$$5,280 \div 3,600 = 1.46666 \text{ feet (1.467) per second a vehicle will travel}$$

Use 1.467 feet/sec to calculate distance traveled for all speeds

Example: 40 mph X 1.467 = 59 feet per second traveled at 40 mph

Simplified method not as accurate, but close:

Speed $\div 2$ = a number, + speed = feet per second traveled

Example: 40 mph $\div 2$ = 20 + 40 mph = 60 feet per second traveled at 40 mph

Reaction Time Distance Calculation

Average reaction time is 3/4 of a second (.75) (driver is alert and ready to react)

To calculate reaction time distance:

speed X feet per second traveled X .75 (reaction time) = feet traveled during reaction time

Example: 40 mph X 1.467 x .75 = 44 feet traveled during reaction time

Example: 40 mph $\div 2$ = 20 + 40 mph = 60 X .75 = 45 feet traveled during reaction time

Braking Distance Calculation

Speed X Speed $\div 10 \div 2$ = Average Braking Distance

Example: 40 mph X 40 mph $\div 10 \div 2$ = 80 feet to stop at 40 mph

Total Stopping Distance

Reaction Time (speed X 1.467 X .75) + Braking Distance (Speed X Speed $\div 10 \div 2$) = Average Stopping Distance

$$\begin{array}{rclcl} \text{Example: } 40 \times 1.467 \times .75 & + & (40 \times 40 \div 10 \div 2) & = & \\ 44 & + & 80 & = & 124 \text{ feet Average Stopping Distance} \end{array}$$

Calculate the following:

SPEED (S)	Feet per second traveled $S \times 1.467 \text{ ft/sec} =$	<u>Reaction Time</u> <u>Distance</u> $S \times 1.467 \times .75 =$	<u>Braking Distance</u> $S \times S \div 10 \div 2 =$	<u>Total Stop Distance</u> Reaction Distance + Braking Distance=
20mph				
30mph				
40mph	$40 \times 1.467 =$ 59 ft/sec	$40 \times 1.467 \times .75 =$ 44 feet	$40 \times 40 \div 10 \div 2 =$ 160 feet	44 feet + 160 feet = 204 feet
50mph				
55mph				
60mph				
65mph				
70mph				
75mph				
80mph				



WORK SHEET Answer

Module 4.1 Calculating Braking Distances

SPEED (S)	Feet per second traveled $S \times 1.467 \text{ ft/sec} =$	Reaction Time Distance $S \times 1.467 \times .75 =$	Braking Distance $S \times S \div 10 \div 2 =$	Total Stop Distance Reaction Distance + Braking Distance=
20mph	$20 \times 1.467 =$ 29.34 ft/sec	$29.34 \times .75 =$ 22.00 ft	$20 \times 20 \div 10 \div 2 =$ 20 ft	$22.00 + 20 =$ 42 ft (14 yds)
30mph	$30 \times 1.467 =$ 44.01 ft/sec	$44.01 \times .75 =$ 33.00 ft	$30 \times 30 \div 10 \div 2 =$ 45 ft	$33.00 \text{ ft} + 45 \text{ ft} =$ 78 ft (26 yds)
40mph	$40 \times 1.467 =$ 59 ft/sec	$40 \times 1.467 \times .75 =$ 44 ft	$40 \times 40 \div 10 \div 2 =$ 80 ft	$44 \text{ feet} + 80 \text{ feet} =$ 124 ft (41.33 yds)
50mph	$50 \times 1.467 =$ 73.35 ft/sec	$73.35 \times .75 =$ 55.0125 ft	$50 \times 50 \div 10 \div 2 =$ 125 ft	$55.0125 \text{ ft} + 125 \text{ ft} =$ 180 ft (60 yds)
55mph	$55 \times 1.467 =$ 80.685 ft/sec	$80.685 \times .75 =$ 60.51 ft	$55 \times 55 \div 10 \div 2 =$ 151.25 ft	$60.51 \text{ ft} + 151.25 \text{ ft} =$ 212 ft (70.6 yds)
60mph	$60 \times 1.467 =$ 88.02 ft/sec	$88.02 \times .75 =$ 66.02 ft	$60 \times 60 \div 10 \div 2 =$ 180 ft	$66.02 \text{ ft} + 180 \text{ ft} =$ 246 ft (82 yds)
65mph	$65 \times 1.467 =$ 95.335 ft/sec	$95.335 \times .75 =$ 71.52 ft	$65 \times 65 \div 10 \div 2 =$ 211.25 ft	$71.52 \text{ ft} + 211.25 \text{ ft} =$ 282.77 ft (94.25 yds)
70mph	$70 \times 1.467 =$ 102.69 ft/sec	$102.69 \times .75 =$ 77.02 ft	$70 \times 70 \div 10 \div 2 =$ 245 ft	$77.02 \text{ ft} + 245 \text{ ft} =$ 322 ft (107.3 yds)
75mph	$75 \times 1.467 =$ 110.025 ft/sec	$110.025 \times .75 =$ 82.52 ft	$75 \times 75 \div 10 \div 2 =$ 281.25 ft	$82.52 \text{ ft} + 281.25 \text{ ft} =$ 363.77 ft (121 yds)
80mph	$80 \times 1.467 =$ 117.36 ft/sec	$117.36 \times .75 =$ 88.02 ft	$80 \times 80 \div 10 \div 2 =$ 320 ft	$88.02 \text{ ft} + 320 \text{ ft} =$ 408 ft (136 yds) almost 1 1/3 football fields